



New DELEGation

Petr Špaček

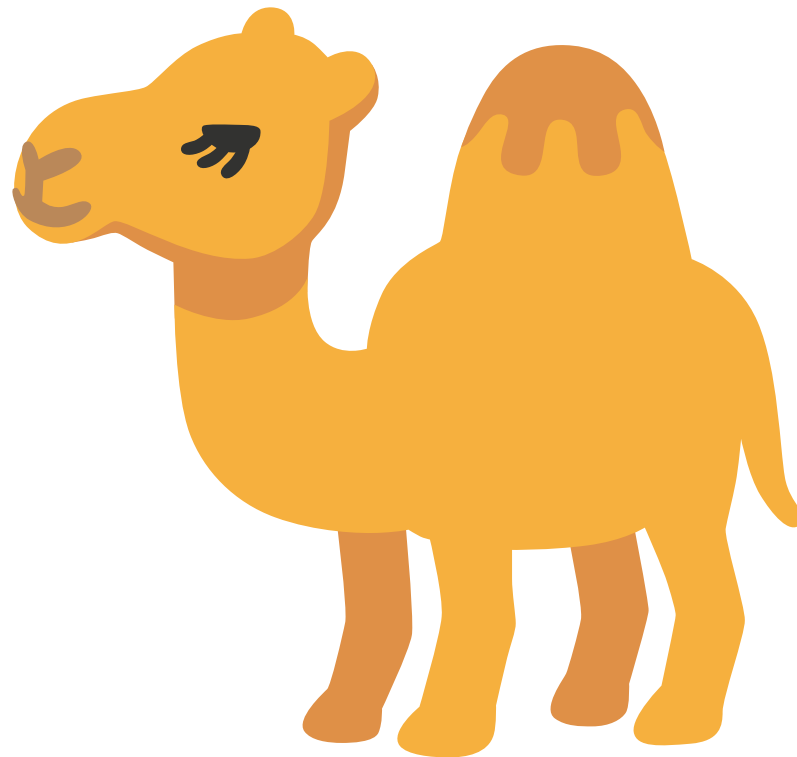
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pspacek@isc.org

Previously on CENTR

- 50th CENTR Tech workshop
 - DELEG *before* version 00
 - https://centr.org/content_page/download/10937/7960/41.html

DNS today

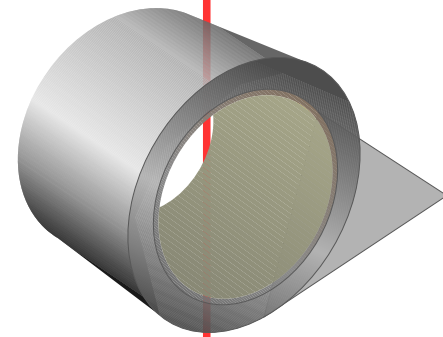


DNS held together with ...

```
$ dig @f.root-servers.net cz. NS
cz.      NS      a.ns.nic.cz.
cz.      NS      b.ns.nic.cz.
cz.      DS      ...
```

- inconsistencies
- ambiguity
- various resolver implementations

```
a.ns.nic.cz.  A  "glue" 194.0.12.1
a.ns.nic.cz.  AAAA 2001:678:f::1
b.ns.nic.cz.  A  194.0.13.1
b.ns.nic.cz.  AAAA 2001:678:10::1
```

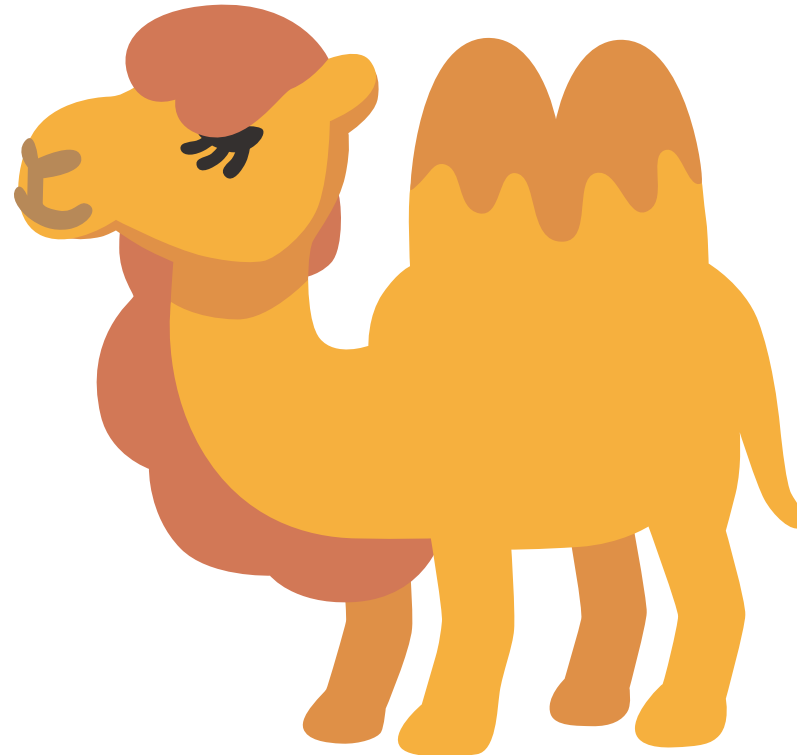


Bunch of records

- No concept of "DNS operator"
- Access control issues
- Multi-operator \Rightarrow chaos ...

```
test.      NS      operator.org.  
test.      NS      op.net.
```

New DELEG



Draft version 08



- <https://datatracker.ietf.org/doc/html/draft-ietf-deleg>
- Implemented by
 - **Akamai** authoritative + resolver
 - **Knot DNS** authoritative, `kdig`
 - **BIND** authoritative, `dig`, ...



DELEG principles

- No changes to NS
- DELEG **extensibility**
- Single DNS tree
 - One domain holder
 - NS
 - DELEG

Why

- Extensibility
 - DNS-over-TLS ...
- Simplification
 - Holder  operator
 - 1 RR = 1 operator
 - **Operator**  technical information
 - **No access to registry required**

Records

- 2 record types
 - DELEG – delegation
 - **DELEGPARAM** – (optional) parameters, indirection
 - same format – SVCB-like
- 2 modes
 - indirection – include-delegparam
 - direct delegation – server-name, server-ipv4/6

Indirection

- Registry

```
example.cz. NS      ...
example.cz. DS      ...
example.cz. DELEG include-delegparam=config123.operator.cz.
example.cz. DELEG include-delegparam=cfg-jozo.elsewhere.sk.
example.cz. RRSIG DELEG ...
```

Delegation to **operators** (plural!)

- Operator #1

```
config123.operator.cz. DELEGPARAM (  
    server-name=ns1.operator.cz., ns2.operator.cz. )
```

```
ns1.operator.cz. A      192.0.2.1
```

```
ns2.operator.cz. AAAA   3fff::555
```

Operator side

- `config123.operator.cz. 600 DELEGPARAM (`
 `server-name=ns1.operator.cz.`
 `transport=dns-over-tls)`
- `config123.operator.cz. 600 RRSIG DELEGPARAM ...`
- **Operator can change**
 - Server parameters – in his own zone
 - TTL

Direct delegation

- Parent zone / registry

```
example.cz. NS ...
```

```
example.cz. DELEG ( server-ipv4=192.0.2.1  
                    server-ipv6=2001:DB8::1 )
```

```
example.cz. DELEG ( server-name=ns1.operator.cz.  
                    transport=dns-over-tls )
```

```
example.cz. RRSIG DELEG ... Extensible
```

- "Advanced"
- Single copy / no glue

Record syntax

- Multi-value
- Extensible parameters
- SVCB-like

```
server-ipv4=192.0.2.1,192.0.2. transport=dns-over-tls ...  
include-delegparam=operator1.example.,operator2.test. ...
```

Timeline

- DELEG does not exist yet
- NS will rule for a loooooong time



DNS client – NS vs. DELEG

- Independent records
- Always use DELEG
 - If present
 - If supported by client
 - Better security guarantees
- **No change** if DELEG not present

DELEG at Registry



Registry – Indirection

- DELEG (
 include-delegparam=operator.example.
 )
- Pointer to **operator**
 - operator != name server

Registry – Extensibility

- DELEG (**server-name=ns1.operator.cz.**
transport=dns-over-tls)
- IANA params registry
 - More over time
- Policy?

Registry – NS vs. DELEG

- Independent?
- NS generated out of DELEG?
 - Policy decision
 - DNS indifferent



Registry – DELEG only



- DELEG can exist without NS
- DELEG (**server-name=ns1.operator.cz.**
transport=dns-over-tls)
 - Intentionally reachable **only** via DoT

Pointers

- IETF dd mailing list

<https://www.ietf.org/mailman/listinfo/dd>

- Draft

<https://datatracker.ietf.org/doc/html/draft-ietf-deleg>

- Work in progress draft (draft of a draft)

<https://ietf-wg-deleg.github.io/draft-ietf-deleg-base/draft-ietf-deleg.html>